

Date of Report: 09/22/15

**BURNED-AREA REPORT**

(Reference FSH 2509.13)

**PART I - TYPE OF REQUEST****A. Type of Report**

- ☒ 1. Funding request for estimated emergency stabilization funds  
☐ 2. Accomplishment Report  
☐ 3. No Treatment Recommendation

**B. Type of Action**

- ☒ 1. Initial Request (Best estimate of funds needed to complete eligible stabilization measures)  
☐ 2. Interim Report # \_\_\_\_\_  
☐ Updating the initial funding request based on more accurate site data or design analysis  
☐ Status of accomplishments to date  
☐ 3. Final Report (Following completion of work)

**PART II - BURNED-AREA DESCRIPTION****A. Fire Name:** Wash Fire**B. Fire Number:** ID-NCF-000881**C. State:** ID**D. County:** Idaho**E. Region:** 01**F. Forest:** Nez Perce-Clearwater**G. District:** Moose Creek RD**H. Fire Incident Job Code:** P1J17M**I. Date Fire Started:** 08/10/2015**J. Date Fire Contained:** 0 percent as of 9/17**K. Suppression Cost:** \$8,000,000 (combined Slide and Wash suppression costs)**L. Fire Suppression Damages Repaired with Suppression Funds**

- a. Dozer Fireline repaired (miles): 3 as of 09/014/2015  
b. Hand Fireline repaired (miles): 0.5 as of 09/14/2015

**M. Watershed Numbers (as of 9/17/2015):**

6 <sup>th</sup> HUC	HUC Name	Acres Burned
170603020305	Buck Lake Creek	2694
170603020402	Glover Creek-Selway River	13351
170603020306	Horse Creek	1153
170603020307	Lower Meadow Creek	15865
170603020304	Middle Meadow Creek	179
170603020404	Ohara Creek	184
170603020205	Otter Creek	392
170603020206	Pinchot Creek-Selway River	100
1706030203403	Rackliff Creek-Selway River	2638

N. **Total Acres Burned** (as of 9/17/2015): 36,555 acres

NFS: 36,544 State: 0 Private: 12

O. **Vegetation Types:** Habitat types consist of groups 5 and 6 from the Nez Perce-Clearwater National Forest Target Stand Groups. Group 5 habitat types (moderately cool and moist western red cedar) are characterized by mixed species stands of western red cedar, grand fir, and Douglas fir, with diverse shrub and forb understories. Cedar/Clintonia is the most frequently found habitat type within the group, while western white pine, larch and ponderosa pine are less frequently found. Group 6 habitat types (moderately cool and wet western red cedar) are characterized by stands of grand fir and western red cedar with diverse shrub and forb understories. Cedar/lady fern is the habitat type most frequently found in this group and is generally limited to riparian areas along streams and moist lower slopes in the western part of the subbasin.

P. **Dominant Soils:** There were 42 unique mapping units identified on the published mapping within the Wash Fire area. A complete list of mapping units is available in the project record. The three dominant Landtypes include 61E48, 61E38, and 50EUU (Clearwater National Forest, 2009). These map units are formed on very steep dissected stream breaklands or dissected mountain slopes. Vegetation consists of moist mixed coniferous forest. The lower soil layers developed from granitic bedrock. The 50EUU are landslide deposits coming from upslope and have vegetation similar to surrounding areas.

Q. **Geologic Types:** The Wash Fire area falls predominantly within metamorphic and granitic series. The Meadow Creek metamorphic, micaceous quartzite, comprises 46% of the area, Idaho Batholith comprises 33% of the area, and 20% of the area is the Syringa Metamorphic series (Enterprise Business Solution Services, 2015). The remaining minor geologic components include other metamorphic rocks and alluvial deposits near the Selway River.

R. **Miles of Stream Channels by Order or Class:**

National Forest

1<sup>st</sup> order 79.4 miles, 2<sup>nd</sup> order 14.8 miles, 3<sup>rd</sup> order 14.7 miles, 4<sup>th</sup> order 1.5 miles, 5<sup>th</sup> order 7.1 miles

S. **Transportation System**

**Trails:** National Forest: 31 miles Other: 0 miles

**Roads:** National Forest: 36 miles Other: 0 miles

### **PART III - WATERSHED CONDITION**

A. **Burn Severity** (acres): 21,934 (low) 4,279 (moderate) 8,109 (high)

B. **Water-Repellent Soil** (acres): (sum of moderate + high) 12,388

C. **Soil Erosion Hazard Rating** (acres): 17 (low) 4,714 (mod) 5,477 (high) 24,149 (very high)

D. **Erosion Potential:** 11.6 tons per acre to 16.3 tons per acre

E. **Sediment Potential:** 9,135 to 12,786 cubic yards per square mile

## **PART IV - HYDROLOGIC DESIGN FACTORS**

- A. **Estimated Vegetative Recovery Period**, (years): 1-3 grass. 5-10 shrubs, 10-50 conifers
- B. **Design Chance of Success**, (percent): 76
- C. **Equivalent Design Recurrence Interval**, (years): 25 year post-fire
- D. **Design Storm Duration**, (hours): 6 and 1 hr
- E. **Design Storm Magnitude**, (inches): 0.9 (6hr), 0.7 (1hr)
- F. **Design Flow**, (cubic feet / second/ square mile): variable by drainage area
- G. **Estimated Reduction in Infiltration**, (percent): 0-80% depending on severity
- H. **Adjusted Design Flow**, (cfs per square mile): variable by drainage area

## **PART V - SUMMARY OF ANALYSIS**

The Wash fire on the Moose Creek Ranger District of the Nez Perce-Clearwater National Forest was ignited by lightning on August 10, 2015. At the time of BAER field assessment, the fire had burned roughly 36,555 acres and will likely be fully contained only with the onset of winter conditions. The fire made a strong run on August 28<sup>th</sup>, due to high winds, hot temperature conditions, on high fuel loading, leading to severe burns in the Meadow Creek drainage.

A. **Describe Critical Values/Resources and Threats (narrative):**

Risks were assigned based on Interim Directive No. 2520-2014-1. After examination of the fire area, the BAER Team (in consultation with other specialists), identified the following values at risk:

**Human Health and Safety:** The Wash Fire consumed a wooden structure containing a single-seat toilet atop a 1,000 gallon concrete vault, located near the top of Indian Hill Road (FS290) at the trailhead for Trails 603, 602 and 621. The vault remains, exposing a hole with two openings, which pose a threat to human health and safety.

***Risk Assessment: Threats to public safety.***

***Probability of Damage or Loss: Likely – High potential of risk to public safety due to open toilet vault.***

***Magnitude of Consequence: Moderate – Risk of injury or illness due to exposure for public safety.***

***Risk Level: High***

**Infrastructure:** Due to fire effects, watersheds within the Wash Creek Fire burn perimeter are likely to generate higher stormflows in the first few years following the fire. Larger flow events, in part, are a function of increased surface runoff from bare hillslopes. Furthermore, burned and exposed soils are more susceptible to erosion, entrainment, and transport to stream channels. This combination of increased runoff and greater susceptibility to erosion threatens stream water quality as well as transportation infrastructure. Transportation infrastructure is a widespread value at risk of damage from post-fire erosion and elevated peak flows below the Wash Creek Fire, including roads, trails and culverts.

**Roads:** There are 36 miles of roads within or immediately downslope of the burn perimeter. Forest Road 290 (Indian Hill road) provides access to thousands of acres of Forest Service land through the Meadow Creek (#726), Indian Hill (#603), Copper Butte (#632), Otter Butte

(#621) Upper Buck Lake (#628) and other trails as well as the Indian Hill Lookout and Meadow Creek Cabin administrative sites. Forest Road 443 (Falls Point road) provides access to National Forest System lands through the Stillman Point (#1545), Buck Meadows (#733), and Horse Creek (#729) roads.

Five road-stream crossings were evaluated on open roads both within and immediately downslope from the burn perimeter with drainages that were affected by the fire. Four of these culverts were on road 443, and the fifth is the bridge over Meadow Creek. There are numerous crossings on the Indian Hill road (discussed below), but all are located in the upper headwaters and not in locations suitable for culvert up-sizing to accommodate post-fire flows. The crossings on road 443 were evaluated for flow capacity in order to determine their adequacy to convey post-fire design storm flow events. Under post-fire conditions, model output suggests that all of these drainages will likely see an increase in post-fire, peak-flow runoff that would exceed culvert capacity and overtop roads, potentially leading to failure of the crossing and road damage. Furthermore, inadequate road drainage to accommodate anticipated increases in post-fire overland flow may also lead to erosion of the roadbed and subsequent damage to road segments below burned hillslopes.

Most culverts at small, mostly ephemeral drainages were judged to be at increased risk of clogging from debris/sediment slides. These culverts typically serve a dual purpose of passing episodic flow from the drainage and ditch storm flow from the road. Burned hillslopes will likely result in higher runoff to the road and to the small drainages. These steep drainages are also more susceptible to small debris torrents or slides. This type of occurrence often plugs the culvert inlet, resulting in flow across the road surface or down the ditch, eroding the road and delivering considerable volumes of sediment to the stream below. These pipes are not set deeply, and are usually at the base of an over-steepened drainage bottom. Thus, a larger culvert is generally not feasible or effective in the post-fire setting. Vertical drop-structures installed at the inlet are effective in some locations at protecting the inlet from being plugged by small debris slides and thus increasing the probability that the culvert will function during runoff events. An armored rolling dip, installed in the downslope direction of the road from the culvert inlet, reduces the likelihood of runoff damaging a large segment of road in the event of a clogged culvert inlet. Another option that can accommodate post-fire sediment-laden runoff is culvert removal and installation of an armored ford, although this treatment can make travel less safe during slippery conditions.

**Risk Assessment:** *Threats to Forest Service roads.*

**Probability of Damage or Loss:** *Likely – High potential of road drainage failure due to post-fire flows.*

**Magnitude of Consequence:** *Major – Risk to public safety, employee/contractor safety, and loss of FS infrastructure*

**Risk Level:** *Very High*

**Trails:** **Trails:** There are 31 total miles of trail located within the Wash Fire on the Moose Creek Ranger District. Only 12.7 miles of trail on six trails are located in moderate and high burn severity.

Affected trails include both motorized and non-motorized access trails. Trail use ranges from light to heavy, and typically occurs between June and November. The trails affected by the fire are shown in the table below. These trails traverse the slopes through the hottest part of the burn in the Meadow Creek and Indian Hill area. The Meadow Creek trail is the access for the Meadow Creek cabin, which is in the rental program and used administratively. Trail infrastructure is threatened by increased surface flow and upland erosion due to post-fire conditions leading to higher sediment loads on existing drainage structures.

Trail	Burn Severity		Total Miles
	High	Moderate	
HORSE POINT	0.4	0.3	0.8
INDIAN HILL	2.4	1.3	3.7
MEADOW CREEK	1.3	2.7	4.0
OTTER CREEK	0.2	0.1	0.3
STILLMAN	1.6	1.7	3.3
CROSSCUT			
STILLMAN RIDGE	0.3	0.3	0.6
<b>Grand Total</b>	<b>6.2</b>	<b>6.4</b>	<b>12.7</b>

**Risk Assessment:** Threats to Forest Service trails and associated structure.

**Probability of Damage or Loss:** Likely – High potential of trail drainage failure due to post-fire flows.

**Magnitude of Consequence:** Moderate – Risk to public safety due to loss infrastructure, Major - loss of FS infrastructure

**Risk Level:** Very High

**Water quality:** Streams in the burned area generally maintain good water quality. Erosion from steep burned hillslopes compromise water quality through transport and deposition of fine sediment in important fishery streams. Elevated erosion and potential failures from roads and trails also compromise water quality. No standalone treatments are proposed to mitigate potential post-fire impacts, however proposed treatments to improve road and trail drainage to will provide protection for water quality as well.

**Risk Assessment:** Threats to water quality.

**Probability of Damage or Loss:** Likely – High potential sediment impacting water quality due to post-fire erosion and increased flows.

**Magnitude of Consequence:** Moderate – damage to critical natural or cultural resources resulting in considerable or long term effects

**Risk Level:** High

**Fisheries:** The Selway River and its tributaries within the Wash Fire perimeter supports important critical habitat for threatened ( summer steelhead, Chinook salmon, bull trout), sensitive (westslope cutthroat trout), and resident fish species (Pacific lamprey, rainbow trout, mountain whitefish, as well as dace, sculpin and suckers). The Wash fire burned designated Critical Habitat for steelhead and bull trout. There is also steelhead designated Critical Habitat in several tributaries within the fire perimeter including, O'Hara, Little Boulder, Fivemile, Buck Lake and Meadow Creek.

The Wash Fire burned through the Riparian Conservation Areas (RCAs) on critical habitat streams within the fire perimeter with varying severity. Moderate to high burn severity intensity occurred within Riparian Habitat Conservation Area's (RHCA) of many drainages in lower Meadow Creek.

Peak flow calculations and hill slope erosion models of the Wash fire predict increased probability of erosion, mass wasting, and sediment delivery to the Selway River. Given the burn severity in the lower Meadow Creek drainage and steelhead, westslope cutthroat trout, Chinook salmon and bull trout distribution, post fire impacts to these fish, and their Critical Habitat could be significant. Increased sediment inputs, and debris flow over the next several years could eliminate viable spawning, rearing and overwintering habitat for these salmonids until many of these fine sediments are transported downstream. Although these effects to spawning habitat are short term they could have lasting impacts to salmonid productivity in Meadow Creek system.



Overlooking a tributary to Little Creek, a drainage within the Lower Meadow Creek subwatershed in the Selway River basin

Road treatments and hillslope treatments could lessen sediment yields to Meadow Creek but are unlikely to largely buffer any other post-fire effect to fisheries or aquatic habitat given the scale of mod-high burn severity on many of the hillslopes along Meadow Creek. Mulching treatments were considered for fisheries habitat protection, but were not deemed cost effective.

***Risk Assessment:*** Threat to TES fisheries habitat.

***Probability of Damage or Loss:*** Very Likely – increased fine sediment or post fire debris flows reaching fish bearing streams and adversely affecting habitat or directly impacting native fish is very likely (90-100% likely occurrence within 1-3 years)

***Magnitude of Consequence:*** Moderate – damage to critical fisheries resources resulting in considerable or long term effects

***Risk Level:*** Very High

**Native Vegetation/Soil Productivity:** Inventories have found four noxious weed species (Spotted knapweed, Canada thistle, Yellow hawkweed, and Scotch thistle) within the Wash fire perimeter. Currently, the Moose Creek Ranger District conducts integrated weed management strategies that deal with weed infestations within the fire areas based on priorities outlined in the Annual Operating Plan for the Clearwater Basin Weed Management Area, a community based cooperative (CBWMA). Idaho's noxious weeds are plant species that have been designated "Noxious" by law in the Idaho Code (title 22, chapter 24, "Noxious Weeds").

Susceptible habitats within the fire contain known infestations of Spotted knapweed, Scotch thistle, and Canada thistle. Small spot infestations of these noxious weeds are scattered along forest roads 443, 290, 9716, 9717, 9721, 9714, 9709, & 9720 which run through the fire perimeter. Other discrete or small populations were identified within campgrounds and trailheads along Meadow Creek.

Fire intensities were generally low to moderate, with high intensity burns occurring in pockets on steep slopes and areas of diseased/dead trees. Most grasses and shrubs in or near infested sites should regenerate because roots and crowns remained intact. However, highly susceptible habitats, existing infestations and exposed mineral soils along roads, trails, and campgrounds greatly increase the risk of invasive weed spread as a result of fire disturbance. The risk of weed expansion has dramatically increased within the Wash Fire due to the interaction of the weed expansion factors and poses a serious threat to ecosystem health.



**Risk Assessment:** Threats to native plant communities due to the establishment or spread of noxious weeds.

**Probability of Damage or Loss:** Very Likely - Based on moderate and high burn severity and proximity to known weed infestations.

**Magnitude of Consequence:** Major – Loss of native plant communities and spread of noxious weeds.

**Risk Level:** Very High

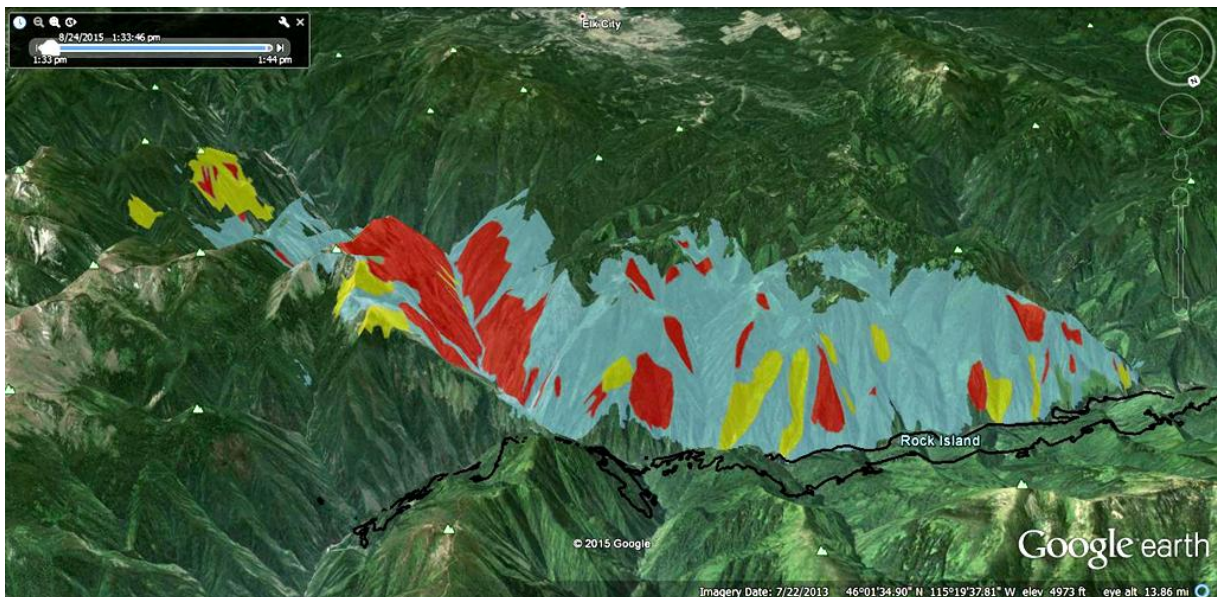
Soils in the Wash burn area consist primarily of a 6-10 inch volcanic ash mantle over soils derived from metasedimentary geology. The predominant rock type in the fire area was quartzite with inclusions of gneiss and schist. The ash mantle on this sites is the primary source of the ecosystem productivity. High severity burn areas located on very steep slopes display the high erosion potential on these landtypes. While there is a high risk to soil productivity, no standalone treatments are proposed to mitigate potential post-fire impacts due to lack of a cost effective treatment option.

**Risk Assessment:** Threat to Soil Productivity

**Probability of Damage or Loss:** Likely – Increased erosion and loss of ash mantle

**Magnitude of Consequence:** Moderate – Loss of long-term soil productivity with high probability of immediate detrimental soil displacement

**Risk Level:** High



Google Earth Image of the Wash fire area from the north looking south with the preliminary burn severity ratings shown.

**Heritage:** After a review of the Nez Perce-Clearwater National Forest Heritage Resource Department files, it was determined that 20 previously recorded cultural resource sites eligible for, or potentially eligible for, the National Register of Historic Places are located within the Area of Potential E of the Wash, Slide and Woodrat Fires and are classified as critical values. These site types range from flammable historic buildings and bridges to resources with moderate susceptibility to post-fire related damage as prehistoric lithic scatters. No treatments are proposed to mitigate potential post-fire impacts due to low risk level.

**Risk Assessment:** Threat to heritage resources

**Probability of Damage or Loss:** Unlikely – Low probability of damage or loss

**Magnitude of Consequence:** Minor – damage to critical cultural resources resulting in minimal, recoverable or localized effects

**Risk Level:** Very Low

## B. Emergency Treatment Objectives:

The emergency treatment objectives are to prevent exposure to human waste with the open vault toilet, prevent the expansion of noxious weeds in areas burned by the Wash Fire, and improve transportation infrastructure in order to accommodate the anticipated increased flows resulting from post-fire watershed response and greatly reduce the likelihood of road failure in the post-fire environment.

In accordance with the revised Forest Service manual, the risk matrix below, Exhibit 2 of Interim Directive No.: 2520-2014-1 was used to evaluate the Risk Level for each value identified during the Wash Fire BAER assessment. Only treatments directly addressing FS Values at Risk with a rating of High or above are being requested for BAER authorized treatments.

Probability of Damage or Loss	Magnitude of Consequences		
	Major	Moderate	Minor
	RISK		
Very Likely	Very High - <b>Native Veg</b>	Very High	Low
Likely	Very High - <b>Roads/Trails</b>	High - <b>Health and Safety</b>	Low
Possible	High	Intermediate	Low
Unlikely	Intermediate	Low	Very Low

**Native Vegetation:** Weed treatments will concentrate on the areas of known weed infestations in an attempt to counter fire-induced weed spread. Immediate weed treatment is needed to prevent known weed infestations from quickly flourishing after the fire and creating large sources of new weed seeds. These areas have high public use, which could exacerbate the spread of the existing populations.

**Transportation Infrastructure (Roads/Trails):** Mitigate effects of changed post-fire watershed response (runoff, erosion, and deposition) by adding road and trail drainage features in the vicinity of the fire-affected drainages.

**Human Health and Safety:** Mitigate the effects of exposure to open toilet vault for human health and safety protection.

## C. Probability of Completing Treatment Prior to Damaging Storm or Event:

Land 70%   Channel N/A   Roads/Trails 70%   Protection/Safety 90%

## D. Probability of Treatment Success

	Years after Treatment		
	1	3	5
Land	70%	*	*
Channel	NA	NA	NA
Roads/Trails	90%	90%	90%
Protection/Safety	90%	90%	90%

\*will depend on follow-up weed treatment not funded through BAER

## E. Cost of No-Action (Including Loss): >\$500,000

The potential cost of no action includes the failure of culverts/stream crossings on major roads in the burned area, severe erosion damage on several public roads needed for FS and public access, entrainment and deposition of road sediment in important fishery streams, and erosion



damage and failure of trails. The cost of repairing roads, trails, and stream crossings would most likely exceed the cost of the selected alternative. The cost of no action would likely be substantially greater than the cost of proposed BAER treatments in road repair expenses alone, whereas the cost to public and personnel safety is more difficult to quantify.

The value of critical habitat for three separate ESA-listed fish species, as well as species of concern, cannot easily be quantified, but would likely far exceed the cost of sediment-mitigation measures proposed here. The value of protecting the ecological integrity and soil productivity of the burned area from noxious weed infestation likely exceeds the cost of weed treatment and monitoring, although this too was not quantified.

#### F. Cost of Selected Alternative (Including Loss): ~ \$163,460.00

Treatments	Costs
<b>Land Treatments (Native Vegetation)</b>	Treatment costs = \$300/acre x 56 acres = \$16,800.00
<b>= \$17,600.00</b>	Average treatment cost (including prep and pre-treatment flagging of sites = \$250.00/acre Average chemical/PPE cost = \$50.00/acre
	Implementation Monitoring = \$800.00 Two days @ \$400.00/day
<b>Transportation Infrastructure</b>	Road drainage improvements = \$28,300.00
<b>= \$128,610.00</b>	Stream culvert upgrades = \$37,400.00
<b>Roads</b>	Hazard tree removal = \$2,400.00
<b>= \$70,900.00</b>	
<b>Trails</b>	Trail drainage improvements = \$47,550.00
<b>= \$57,710.00</b>	Hazard tree removal = \$11,600.00
<b>Protection/Safety</b>	Warning signs = \$3,750.00
<b>= \$17,250.00</b>	Secure vault toilet = \$1,500.00
	Campground closure = \$5,000.00
	FS Pipe Gates = \$7,000.00

#### G. Skills Represented on Burned-Area Survey Team:

<input checked="" type="checkbox"/> Hydrology	<input checked="" type="checkbox"/> Soils	<input checked="" type="checkbox"/> Range	<input checked="" type="checkbox"/> Weeds
<input type="checkbox"/> Forestry	<input type="checkbox"/> Wildlife	<input checked="" type="checkbox"/> Fire Mgmt.	<input checked="" type="checkbox"/> Engineering
<input type="checkbox"/> Contracting	<input type="checkbox"/> Ecology	<input checked="" type="checkbox"/> Botany	<input checked="" type="checkbox"/> Archaeology
<input checked="" type="checkbox"/> GIS	<input type="checkbox"/> Air Quality	<input checked="" type="checkbox"/> Research	<input checked="" type="checkbox"/> Fisheries
<input checked="" type="checkbox"/> Recreation			

**Team Leader:** Marci Nielsen-Gerhardt

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**Forest BAER Coordinator:** Cara Farr

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### Core Team Members:

- Marci Nielsen-Gerhardt - Team Lead
- Dave Callery - Hydrology
- Andre Snyder - Hydrology
- Jim Gries - Soils
- Rebecca Lloyd - Soils (t)
- Chris Martin - Engineering (t)
- Pete Robichaud - Research
- Heather Berg - Recreation
- Randy Boedy - Heritage
- John Warofka - Noxious Weeds
- Katie Howisey - Noxious Weeds (t)
- John Hutchison - GIS
- Allison Johnson - Fisheries

### H. Treatment Narrative:

#### Land Treatments:

Noxious weed control with herbicides is recommended for new invader infestations within the Wash Fire. Herbicide applications will follow the requirements and mitigation outlined under the latest NEPA and Biological Assessment for listed fish species. A weed management strategy within the Clearwater River Basin Weed Management Area is currently in place.

Inventory of roads, dozer and hand lines, drop points, camps, and any susceptible sites for both current and new invader weed populations, and monitoring of weed control methods should be initiated to determine potential for weed spread and effectiveness of treatments.

- Treat satellite infestations of spotted knapweed along Forest Roads 443, 290, 9716, 9717, 9721, 9714, 9709, & 9720, within the burned area. The knapweed population along the road system is contributing a seed source and the road system is acting as a spread corridor for further expansion into the burned areas.
- Treat small infestations of spotted knapweed at trailheads and campgrounds within the burn.
- Treat Scotch thistle at Slims Camp Campground which is the main trailhead to Meadow Creek Trail #726.
- Monitor weed populations within and adjacent to the fire to determine if the combination of fire disturbance and susceptible habitat facilitates weed spread or increases weed densities, along with post treatment effective monitoring.

Treatment Area	Acres	Season	Total Treatment (acres X # of treatments)
Spot treat spotted knapweed along Forest Service Roads 443, 290, 9716, 9717, 9721, 9714, 9709, & 9720 within the burn.	40 acres	Summer	40 acres
Spot treat spotted knapweed & Canada thistle at campgrounds and trailheads along Meadow Creek.	7 acres	Spring and Fall	14 acres
Spot treat scotch thistle at Slims Camp Campground & T.H.	1 acres	Spring and Fall	2 acres
<b>Total</b>	<b>acres</b>		<b>56 acres</b>

**Channel Treatments:** No channel treatment prescribed at this time

**Transportation Infrastructure (Road/Trail) Treatments:**

### Road Treatments:

Road treatments will be targeted at effectively draining anticipated increased runoff in the first several years following the fire. Efforts will include clearing of clogged ditches and cross drain inlets and outlets, re-establishment of damaged/non-functional ditches, as well as replacement of burned drainage structures and cross drains. Armored rolling dips will be installed immediately downslope of most stream crossings in order to protect the road prism in the event of a flood event that overtops the road. Work will be done on open roads within the burned area that were judged to be at high risk of elevated post-fire runoff. Without proposed treatments, overland flow and erosion will likely damage the roads as well as transport sediment to streams, impacting water quality and aquatic habitat. In the steep terrain and landslide-prone soils of the burned area, roads would likely be heavily eroded in the first year following the fire in their current condition.

Primary roads affected include the Indian Hill Road (FS290) and the Falls Point Road (FS443). All roads within or below the burned area should be graded to improve drainage. Cross-drain culverts should be cleaned, and drop-inlets installed where the site will accommodate it. Ditches should be restored to functioning condition where they are currently filled or otherwise not functioning. District personnel should plan to be available for “storm patrol” of area roads during larger runoff events, and be prepared to unclog the inlets of culverts and other emergency road drainage work, especially in the first year following the burn.

- **Culverts:** A hydrologic analysis was completed to determine areas of potentially increased flows from burned areas. After areas of concern were determined, an extensive analysis was completed on each of the main culverts on their respective roads. All of the culverts determined to be undersized for the post-fire design event are recommended for upgrade or removal on forest road 443. The two uppermost culvert locations may be more suited to culvert removal, as they are at locations more susceptible to clogging, even with a larger culvert.

Recommended culvert upgrades to accommodate post-fire 25-year event

Site	Drainage mod-high burn severity	Current culvert	Recommended culvert	Cost
443-1	31%	36" round	57"x38" pipe arch	\$10,000.00
443-2	61%	24" round	57"x38" pipe arch	\$10,000.00
443-3	50%	18" round	42"x29" pipe arch	\$8,700.00
443-4	58%	18" round	42"x29" pipe arch	\$8,700.00

- **Rolling Dips / Water Bars:** Rolling dips and water bars are recommended to be constructed to effectively drain the effected road prisms. This temporary drainage structure will help to maintain the transportation system within the burn perimeter during increased flows.

### Trail Treatments:

Trail work will treat the segments of the trail system within the burned area that is at high risk of damage from elevated post-fire runoff and erosion. Treatments will consist installation and replacement of drainage structures in anticipation of greater runoff and erosion, cleaning of existing intact drainage structures, and spot outsloping to improve trail drainage especially on steep slopes and near streams.

- **Drainage Structures:** Drainage structures currently existing will be cleaned and additional drainage structures will be installed to accomidate post-fire runoff and erosion.

- **Tread Outsloping:** Outsloping of trail tread in areas of moderate and high severity burn. Trail tread will be outsloped to allow for drainage for extensive portions of trail in identified lengths of high severity burn and spot treatments in moderate severity burn.

**Hazard Tree Removal:**

Selective hazard tree removal is recommended for health and safety of workers during BAER treatment implementation within the burn area. The hazard tree removal will occur at the treatment locations along road and trail prisms. This will only address immediate safety needs of BAER personnel. Additional hazard tree removal will be needed for long-term safety.

**Protection/Safety Treatments:**

Warning signs will be posted along roads and at trailheads about entering burned area and associated hazards.

Closure of Slims Campground on Meadow Creek is recommended to overnight camping during peak flow periods within the first year following the fire. Barriers will be placed to limit use through this time frame. Signs will also be installed at the campground informing visitors of the risks at the site due to post-fire conditions.

Clean-up of the Indian Hill Toilet vault toilet would include pumping human waste and removal of the vault. Vault removal includes filling of the hole to eliminate fall hazard. It is recommended that this low use toilet not be replaced.

**I. Monitoring Narrative:**

**(Describe the monitoring needs, what treatments will be monitored, how they will be monitored, and when monitoring will occur. A detailed monitoring plan must be submitted as a separate document to the Regional BAER coordinator.)**

**Storm Inspection and Response:** Since increased runoff from burned slopes is not entirely predictable, continued storm monitoring along roads and trails within the burn perimeter has been prescribed. This will ensure that problems with the transportation system due to increased runoff are determined early, and solutions can be formed before a failure occurs.

**Weed Treatment Effectiveness Monitoring:** In 2016 all of the known areas of infestation will be re-surveyed by NP-CNF Weeds staff. Any noxious weed populations not effectively treated during initial treatment efforts will be targeted for additional herbicide application.

## VI – Emergency Stabilization Treatments and Source of Funds

Line Items	Units	Unit Cost	NFS Lands		Other
			# of Units	BAER \$	
<b>A. Land Treatments</b>					
<i>Weed treatment &amp; assessment</i>	<i>acre</i>	<i>300</i>	<i>56</i>	<i>\$16,800</i>	
<i>Subtotal Land Treatments</i>				<i>\$16,800</i>	<i>\$0</i>
<b>B. Channel Treatments</b>					
<i>Subtotal Channel Treat.</i>				<i>\$0</i>	<i>\$0</i>
<b>C. Road and Trails</b>					
<b>Roads</b>					
<i>Install Rolling Dips</i>	<i>ea</i>	<i>200</i>	<i>19</i>	<i>\$3,800</i>	
<i>Install Armored Rolling Dips</i>	<i>ea</i>	<i>800</i>	<i>10</i>	<i>\$8,000</i>	
<i>Culvert Removal</i>	<i>ea</i>	<i>750</i>	<i>18</i>	<i>\$13,500</i>	
<i>Stormproof road, drain</i>	<i>mile</i>	<i>500</i>	<i>6</i>	<i>\$3,000</i>	
<i>Site 443-1 Culvert Upsize</i>	<i>ea</i>	<i>10,000</i>	<i>1</i>	<i>\$10,000</i>	
<i>Site 443-2 Culvert Upsize</i>	<i>ea</i>	<i>10,000</i>	<i>1</i>	<i>\$10,000</i>	
<i>Site 443-3 Culvert Upsize</i>	<i>ea</i>	<i>8,700</i>	<i>1</i>	<i>\$8,700</i>	
<i>Site 443-4 Culvert Upsize</i>	<i>ea</i>	<i>8,700</i>	<i>1</i>	<i>\$8,700</i>	
<i>Spot hazard tree removal</i>	<i>mile</i>	<i>800</i>	<i>3</i>	<i>\$2,400</i>	
<i>Road Storm Patrol</i>	<i>day</i>	<i>280</i>	<i>10</i>	<i>\$2,800</i>	
<b>Trails</b>					
<i>Outsloping (Mod Severity)</i>	<i>mile</i>	<i>600</i>	<i>6.4</i>	<i>\$3,840</i>	
<i>Outsloping (High Severity)</i>	<i>mile</i>	<i>1,300</i>	<i>6.2</i>	<i>\$8,060</i>	
<i>Clean drain structures</i>	<i>ea</i>	<i>90</i>	<i>135</i>	<i>\$12,150</i>	
<i>Replace damaged drainage structures</i>	<i>ea</i>	<i>100</i>	<i>135</i>	<i>\$13,500</i>	
<i>Install drainage structures</i>	<i>ea</i>	<i>100</i>	<i>100</i>	<i>\$10,000</i>	
<i>Spot hazard tree removal</i>	<i>mile</i>	<i>800</i>	<i>12.7</i>	<i>\$10,160</i>	
<i>Subtotal Road &amp; Trails</i>				<i>\$128,610</i>	<i>\$0</i>
<b>D. Protection/Safety</b>					
<i>Warning signs</i>	<i>ea</i>	<i>150</i>	<i>25</i>	<i>\$3,750</i>	
<i>Secure vault toilet site</i>	<i>ea</i>	<i>1,500</i>	<i>1</i>	<i>\$1,500</i>	
<i>Slims Campground closure barricades</i>	<i>ea</i>	<i>5,000</i>	<i>1</i>	<i>\$5,000</i>	
<i>FS Pipe Gate</i>	<i>ea</i>	<i>3,500</i>	<i>2</i>	<i>\$7,000</i>	
<i>Subtotal Structures</i>				<i>\$17,250</i>	<i>\$0</i>
<b>E. BAER Evaluation</b>					
<i>Assessment</i>					<i>\$17,476</i>
<i>Subtotal Evaluation</i>					<i>\$17,476</i>
<b>F. Monitoring</b>					
<i>Weed Treatment Effectiveness</i>	<i>acre</i>	<i>400</i>	<i>2</i>	<i>\$800</i>	
<i>Subtotal Monitoring</i>				<i>\$800</i>	<i>\$0</i>
<b>G. Totals</b>				<i>\$163,460</i>	<i>\$17,476</i>
Previously approved					
Total for this request				<b>\$163,460</b>	

**PART VII - APPROVALS**

*/S/ Cheryl F. Probert*

	<u>10/2 /2015</u>
Cheryl F. Probert, Nez Perce-Clearwater NF Forest Supervisor	Date

	<u>/2015</u>
Region 1 Regional Forester	Date